

REMARKS

Claims 1-2, 4, 9 and 11 are pending in the present application. Claim 1 is herein amended. New claim 11 has been added. Claim 6 is herein cancelled. No new matter is believed to have been introduced through the new claim or claim amendment. Further, upon belief, it is respectfully submitted that this paper is fully responsive to the outstanding Office Action.

Claim Rejections - 35 U.S.C. §103

Claims 1, 2, 4, 6 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sadahiro et al (US 6,467,337 B2) and further in view of Katayama (US 4,696,277) and Reimer (US 6,484,088).

The rejection is respectfully traversed.

Claim 1 is herein amended to recite, “a fuel management system for a working machine (1), comprising: a working machine (1); a server (10); and a user terminal (20), wherein: said working machine comprises: tank contents amount measurement means (11B) which measures a volume contained in a fuel tank (81) of said working machine (1); tank contents weight measurement means (11C) which measures weight of the contents in said fuel tank (81); operational value measurement means (11A) which measures a predetermined operational value related to fuel consumption operation of said working machine (1); and a communication

controller (13) which transmits, to said server, machine information including a volume value of said contents measured by said tank contents amount measurement means (11B) and a measurement value measured by said operational value measurement means (11A); said server comprises: a communication control unit (41) which receives said machine information from said working machine; remaining fuel volume calculation means (54) which calculates an expected remaining fuel volume value, which is an amount of remaining fuel which ought to be present within said fuel tank (81) based on the measurement value measured by said operational value measurement means (11A) included in said machine information volume comparison means (55) which compares said volume value of contents which has been measured by the tank contents amount measurement means (11B) included in said machine information, with said expected remaining fuel volume value which has been calculated by said remaining fuel amount calculation means (54); remaining fuel weight calculation means (56) for calculating an expected remaining fuel weight, which is weight of the remaining fuel which ought to be present within said fuel tank (81), based on the volume of said contents which has been measured by said tank contents amount measurement means (11B) included in said machine information, and on a specific gravity of said fuel; weight comparison means (57) which compares the weight of said contents which has been measured by said tank contents weight measurement means (11C) included in said machine information, with said expected remaining fuel weight which has been calculated by said remaining fuel weight calculation means (56); and alarm issue means (58) which issues an alarm to said user terminal (20) in response to said volume comparison means (55) and said weight comparison means (57), wherein said alarm issue means (58) issues an

alarm to said user terminal (20) when said volume value of contents which has been measured by the tank contents amount measurement means (11B) does not agree with said expected remaining fuel volume value , whereby a user can detect that fuel in the fuel tank(81) has been stolen, and said alarm issue means (58) issues an alarm to said user terminal (20) when the weight of contents which has been measured by the tank contents weight measurement means (11C) does not agree with said expected remaining fuel weight value , whereby the user can detect that foreign matter has been mixed in said fuel tank (81).” It is respectfully submitted that the cited art, either alone or in combination, fails to teach or suggest at least the aforementioned recitation of claim 1 of the present application.

It is submitted that working machines may be left on a construction site 24 hours a day. No watchman exists there, especially at night, because the construction site is in remote areas of the country, in general. Therefore, it may happen that they are subjected to damage such as extraction of the fuel, or placing foreign matter like sand or water or the like into the fuel tank (see page 2, line 7-16).

This invention was made in the above background. The feature of the invention is that it comprises volume comparison means (55) which compares the actually measured volume value of the contents in the fuel tank with the expected remaining fuel volume value; remaining fuel weight calculation means (56) for calculating an expected remaining fuel weight based on the volume of the contents and on a specific gravity of the fuel; weight comparison means (57)

which compares the actually measured weight of said contents in the fuel tank with the expected remaining fuel weight; and alarm issue means (58) which issues an alarm to said user terminal in response to said volume comparison means and said weight comparison means.

No references describe nor suggest, at least, the remaining fuel weight calculation means and the weight comparison means of claim 1 of the present application. For example, Reimer describes the invention which can optimize refueling of a vehicle based on a location for refilling, a location of the vehicle and a remaining value of fuel of the vehicle. It never describes nor suggests the remaining fuel weight calculation means and the weight comparison means of this invention.

Furthermore, this invention is not a simple combination of a known fuel management system for a working machine and one known element. There are two reasons why described below:

(1) This invention comprises the volume comparison means which compares the actually measured volume value of the contents with the expected remaining fuel volume value, so that it can already check the remaining contents of the fuel tank based on the volume.

Therefore, it is not necessary to check the remaining contents of fuel tank based on the weight further. In other words, this invention rather teaches away to have another checking

means to check the remaining contents of the fuel tank. So, it is uniquely challenging or difficult for one of ordinary skill in the art to check the remaining contents of fuel tank using both the volume and the weight.

(2) The feature of the remaining fuel weight calculation means of this invention is that it calculates the expected remaining fuel weight based on the actually measured volume of the contents which is used by the volume comparison means. Using the actually measured volume of the contents which is also used by the volume comparison means for calculating the expected remaining fuel weight is not known but unique at the time of the invention. In other words, calculating the expected remaining fuel weight based on the actually measured volume of the contents which is used by the volume comparison means is quite uniquely challenging or difficult for one ordinary skill in the art.

Therefore, this invention is not obvious. Further, you can get unpredictable results from the invention as described below.

It may happen that a person not only simply extracts the fuel from the fuel tank of a working machine but also attempts a cover-up of the extraction of the fuel. In other words, the person may put water which is the same volume of the fuel extracted from the fuel tank.

For example, if the person extracts 50L of the fuel from the fuel tank and puts 50L of water into it, the volume of the contents of it remains unchanged. At this time, you cannot detect the extraction only comparing the volume of the contents.

Then, according to this invention, you can certainly detect the putting of water into the fuel tank (i.e. mixture of foreign matters) by calculating the expected remaining fuel weight based on the actually measured volume of the contents which is also used by the volume comparison means and on a specific gravity of the fuel, and comparing the expected remaining fuel weight with the actually measured weight, even if the cover-up like above mentioned has been attempted.

Claims 2, 4 and 9 each depend from independent claim 1, therefore said claims are patentable for at least the reason of their respective dependencies from independent claim 1. Further, the arguments presented over the cited art with regard to independent claim 1 are applicable here where appropriate. Separate and individual consideration of the dependent claims is respectfully requested.

In view of the foregoing, it is respectfully submitted that the rejection is overcome.

Claims 6 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Reimer and Katayama as applied to claim 1 and further in view of Tatsuya (JP Publ. 2003-254713).

The rejection is respectfully traversed.

As claims 6 and 9 depend from independent claim 1, it is submitted that the arguments presented above regarding Reimer and Katayama are applicable here where appropriate; and further, said claims are patentable for at least the reason of their respective dependencies. Nothing has been cited in Tatsuya which cures the aforementioned deficiencies of Reimer and Katayama.

New Claim

New claim 11 is herein added. It is submitted that the cited art fails to describe the recitations of said claim. Accordingly, it is submitted that new claim 11 is patentable in view of the cited art.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

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Art Unit: 3747

Amendment under 37 CFR §1.111
Attorney Docket No.: 062438

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,
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